SERVLETS - DATABASE ACCESS

This tutorial assumes you have understanding on how JDBC application works. Before starting with database access through a servlet, make sure you have proper JDBC environment setup along with a database.

For more detail on how to access database using JDBC and its environment setup you can go through our JDBC Tutorial.

To start with basic concept, let us create a simple table and create few records in that table as follows:

Create Table

To create the **Employees** table in TEST database, use the following steps:

Step 1:

Open a **Command Prompt** and change to the installation directory as follows:

```
C:\>
C:\>cd Program Files\MySQL\bin
C:\Program Files\MySQL\bin>
```

Step 2:

Login to database as follows

```
C:\Program Files\MySQL\bin>mysql -u root -p
Enter password: ********
mysql>
```

Step 3:

Create the table **Employee** in **TEST** database as follows:

```
mysql> use TEST;
mysql> create table Employees
    (
     id int not null,
     age int not null,
     first varchar (255),
     last varchar (255)
    );
Query OK, 0 rows affected (0.08 sec)
mysql>
```

Create Data Records

Finally you create few records in Employee table as follows:

```
mysql> INSERT INTO Employees VALUES (100, 18, 'Zara', 'Ali');
Query OK, 1 row affected (0.05 sec)

mysql> INSERT INTO Employees VALUES (101, 25, 'Mahnaz', 'Fatma');
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO Employees VALUES (102, 30, 'Zaid', 'Khan');
Query OK, 1 row affected (0.00 sec)
```

```
mysql> INSERT INTO Employees VALUES (103, 28, 'Sumit', 'Mittal');
Query OK, 1 row affected (0.00 sec)

mysql>
```

Accessing a Database:

Here is an example which shows how to access TEST database using Servlet.

```
// Loading required libraries
import java.io.*;
import java.util.*;
import javax.servlet.*;
import javax.servlet.http.*;
import java.sql.*;

public class DatabaseAccess extends HttpServlet{

  public void doGet(HttpServletRequest request,
                    HttpServletResponse response)
            throws ServletException, IOException
  {
      // JDBC driver name and database URL
      static final String JDBC_DRIVER="com.mysql.jdbc.Driver";
      static final String DB_URL="jdbc:mysql://localhost/TEST";

      //  Database credentials
      static final String USER = "root";
      static final String PASS = "password";

      // Set response content type
      response.setContentType("text/html");
      PrintWriter out = response.getWriter();
      String title = "Database Result";
      String docType =
        "<!doctype html public \"-//w3c//dtd html 4.0 " +
         "transitional//en\">\n";
         out.println(docType +
         "<html>\n" +
         "<head><title>" + title + "</title></head>\n" +
         "<body bgcolor=\"#f0f0f0\">\n" +
         "<h1 align=\"center\">" + title + "</h1>\n");
      try{
         // Register JDBC driver
         Class.forName("com.mysql.jdbc.Driver");

         // Open a connection
         conn = DriverManager.getConnection(DB_URL,USER,PASS);

         // Execute SQL query
         stmt = conn.createStatement();
         String sql;
         sql = "SELECT id, first, last, age FROM Employees";
         ResultSet rs = stmt.executeQuery(sql);

         // Extract data from result set
         while(rs.next()){
            //Retrieve by column name
            int id  = rs.getInt("id");
            int age = rs.getInt("age");
            String first = rs.getString("first");
            String last = rs.getString("last");

            //Display values
            out.println("ID: " + id + "<br>");
            out.println(", Age: " + age + "<br>");
            out.println(", First: " + first + "<br>");
            out.println(", Last: " + last + "<br>");
         }
         out.println("</body></html>");
```

```
         // Clean-up environment
         rs.close();
         stmt.close();
         conn.close();
      }catch(SQLException se){
         //Handle errors for JDBC
         se.printStackTrace();
      }catch(Exception e){
         //Handle errors for Class.forName
         e.printStackTrace();
      }finally{
         //finally block used to close resources
         try{
            if(stmt!=null)
               stmt.close();
         }catch(SQLException se2){
         }// nothing we can do
         try{
            if(conn!=null)
            conn.close();
         }catch(SQLException se){
            se.printStackTrace();
         }//end finally try
      } //end try
   }
}
```

Now let us compile above servlet and create following entries in web.xml

```
....
 <servlet>
     <servlet-name>DatabaseAccess</servlet-name>
     <servlet-class>DatabaseAccess</servlet-class>
 </servlet>

 <servlet-mapping>
     <servlet-name>DatabaseAccess</servlet-name>
     <url-pattern>/DatabaseAccess</url-pattern>
 </servlet-mapping>
....
```

Now call this servlet using URL http://localhost:8080/DatabaseAccess which would display following response:

DATABASE RESULT

```
ID: 100, Age: 18, First: Zara, Last: Ali
ID: 101, Age: 25, First: Mahnaz, Last: Fatma
ID: 102, Age: 30, First: Zaid, Last: Khan
ID: 103, Age: 28, First: Sumit, Last: Mittal
```